Naval Education and Training Command

NAVEDTRA 10450-A1
March 1977
0503-LP-479-0500

Nonresident Training Course (NRTC)

Mathematics, Part III

Only one answer sheet is included in the NRTC. Reproduce the required number of sheets you need or get answer sheets from your ESO or designated officer.

Although the words "he," "him," and "his" are used sparingly in this manual to enhance communication, they are not intended to be gender driven nor to affront or discriminate against anyone reading this material.

MATHEMATICS, PART III
NAVEDTRA 10450-A1

Prepared by the Naval Education and Training Program Management Support Activity (NETPMSA), Pensacola, Florida

Congratulations! By enrolling in this course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program. You have taken an important step in self-improvement. Keep up the good work.

HOW TO COMPLETE THIS COURSE SUCCESSFULLY

ERRATA: If an errata comes with this course, make all indicated changes or corrections before you start any assignment. Do not change or correct the associated text or assignments in any other way.

TEXTBOOK ASSIGNMENTS: The text for this course is *Mathematics, Volume 3*, NAVEDTRA 10073-A1. The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions in the course. Pay close attention to tables and illustrations because they contain information that will help you understand the text. Read the learning objectives provided at the beginning of each chapter or topic in the text and/or preceding each set of questions in the course. Learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

SELECTING YOUR ANSWERS: After studying the associated text, you should be ready to answer the questions in the assignment. Read each question carefully, then select the BEST answer. Be sure to select your answer from the subject matter in the text. You may refer freely to the text and seek advice and information from others on problems that may arise in the course. However, the answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the same course. Failure to follow these rules can result in suspension from the course and disciplinary action.

ANSWER SHEETS: You must use answer sheets designed for this course (NETPMSA Form 1430/5, Stock Ordering Number 0502-LP-216-0100). Use the answer sheets provided by Educational Services Officer (ESO), or you may reproduce the one in the back of this course booklet.

SUBMITTING COMPLETED ANSWER SHEETS: As a minimum, you should complete at least one assignment per month. Failure to meet this requirement could result in disenrollment from the course. As you complete each assignment, submit the completed answer sheet to your ESO for grading. You may submit more than one answer sheet at a time.

GRADING: Your ESO will grade each answer sheet and notify you of any incorrect answers. The passing score for each assignment is 3.2. If you receive less than 3.2 on any assignment, your ESO will list the questions you answered incorrectly and give you an answer sheet marked "RESUBMIT." You must redo the assignment and complete the RESUBMIT answer sheet. The maximum score you can receive for a resubmitted assignment is 3.2.

COURSE COMPLETION: After you have submitted all the answer sheets and have earned at least 3.2 on each assignment, your command should

give you credit for this course by making the appropriate entry in your service record.

NAVAL RESERVE RETIREMENT CREDIT: If you are a member of the Naval Reserve, you will receive retirement points if you are authorized to receive them under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 14 points. These points will be credited in units as shown below:

Unit 1 - 8 points upon satisfactory completion of Assignments 1 through 3

Unit 2 - 6 points upon satisfactory completion of Assignments 4 and 5

(Refer to BUPERSINST 1001.39 for more information about retirement points.)

STUDENT QUESTIONS: If you have questions concerning the administration of this course, consult your ESO. If you have questions on course content, you may contact NETPMSA at:

DSN: 922-1673
Commercial: (904) 452-1673
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COURSE OBJECTIVES: In completing this nonresident training course, you will demonstrate an understanding of the following subjects: numbering systems used in digital computers and computer programming; Boolean algebra; binomial theorem; statistics, statistical inference, matrices, and determinants; and calculus.

Naval courses may include several types of questions--multiple-choice, true-false, matching, etc. The questions are not grouped by type but by subject matter. They are presented in the same general sequence as the textbook material upon which they are based. This presentation is designed to preserve continuity of thought, permitting step-by-step development of ideas. Not all courses use all of the types of questions available. You can readily identify the type of each question, and the action required, by reviewing of the samples given below.

MULTIPLE-CHOICE QUESTIONS

Each question contains several alternative answers, one of which is the best answer to the question. Select the best alternative, and blacken the appropriate box on the answer sheet.

SAMPLE

s-1. The first U.S. Navy nuclear-powered vessel was what type of ship?

1. Carrier
2. Submarine
3. Destroyer
4. Cruiser

Indicate in this way on your answer sheet:

	1	2	3	4	
	T	F			
s-1	☐	■	☐	☐	_ _ _

TRUE-FALSE QUESTIONS

Mark each statement true or false as indicated below. If any part of the statement is false, the entire statement is false. Make your decision, and blacken the appropriate box on the answer sheet.

SAMPLE

s-2. Shock will never be serious enough to cause death.

1. True
2. False

Indicate in this way on your answer sheet:

	1	2	3	4	
	T	F			
s-2	☐	■	☐	☐	_ _ _

MATCHING QUESTIONS

Each set of questions consists of two columns, each listing words, phrases or sentences. Your task is to select the item in column B which is the best match for the item in column A. Items in column B may be used once, more than once, or not at all. Specific instructions are given with each set of questions. Select the numbers identifying the answers and blacken the appropriate boxes on your answer sheet.

SAMPLE

In answering questions s-3 through s-6, SELECT from column B the department where the shipboard officer in column A functions. Responses may be used once, more than once, or not at all.

A. OFFICER	B. DEPARTMENT
s-3. Damage Control Assistant	1. Operations Department
s-4. CIC Officer	2. Engineering Department
s-5. Disbursing Officer	3. Supply Department
s-6. Communications Officer	4. Navigation Department

Indicate in this way on your answer sheet:

	1	2	3	4	
	T	F			
s-3	☐	■	☐	☐	_ _ _
s-4	■	☐	☐	☐	_ _ _
s-5	☐	☐	■	☐	_ _ _
s-6	■	☐	☐	☐	_ _ _

Assignment 1

Sequence and Series; Mathematical Induction and the Binomial Theorem

Textbook Assignment: Chapters 1 and 2

In this course you will demonstrate that learning has taken place by correctly answering training items. The mere physical act of indicating a choice on an answer sheet is not in itself important; it is the mental achievement, in whatever form it may take, prior to the physical act that is important and toward which correspondence course learning objectives are directed. The selection of the correct choice for a correspondence course training item indicates that you have fulfilled, at least in part, the stated objective(s).

The accomplishment of certain objectives, for example, a physical act such as drafting a memo, cannot readily be determined by means of objective type correspondence course items; however, you can demonstrate by means of answers to training items that you have acquired the requisite knowledge to perform the physical act. The accomplishment of certain other learning objectives, for example, the mental acts of comparing, recognizing, evaluating, choosing, selecting, etc., may be readily demonstrated in a correspondence course by indicating the correct answers to training items.

The comprehensive objective for this course has already been given. It states the purpose of the course in terms of what you will be able to do as you complete the course.

The detailed objectives in each assignment state what you should accomplish as you progress through the course. They may appear singly or in clusters of closely related objectives, as appropriate; they are followed by items which will enable you to indicate your accomplishment.

All objectives in this course are learning objectives and items are teaching items. They point out important things, they assist in learning, and they should enable you to do a better job for the Navy.

This self-study course is only one part of the total Navy training program; by its very nature it can take you only part of the way to a training goal. Practical experience, schools, selected reading, and the desire to accomplish are also necessary to round out a fully meaningful training program.

● Make the following changes in your textbook:

In lines 1 and 2 (left column), page 16, change: "is not defined" to read "the series is divergent"

In line 16 (left column), page 16, add: "Therefore the series is divergent" after "$\lim_{n \to \infty} S_n = \infty$"

In problem #1 (left column), page 16, change: "3^n" to read "$3n$"

In lines 4 and 7 (right column), page 16, change: "3^n" to read "$3 \cdot 2^{n-1}$"

Learning Objective:

Solve problems involving arithmetic and geometric sequences by applying appropriate formulas.

1-1. Write the 5th term of the arithmetic sequence $1, \frac{3}{2}, 2, \ldots$.

1. 3
2. $\frac{7}{2}$
3. 4
4. 5

1-2. What is the 22nd term of the arithmetic sequence $1, \frac{5}{3}, \frac{7}{3}, \ldots$?

1. 8
2. 11
3. 15
4. 22

1-3. How many terms are in a sequence if the last term is 49, the difference is 3, and the first term is -5?

1. 13
2. 16
3. 19
4. 24

1-4. What is the first term of the arithmetic sequence whose 4th term is 16 and 8th term is 40?

1. 4
2. 2
3. 0
4. -2

1-5. What would be the mean of the sequence whose first term is 32 and last term is 64?

1. 64
2. 48
3. 32
4. 28

1-6. If there are three means between -8 and +28 then one of the means is

1. 1
2. 5
3. 18
4. 21

1-7. The sum of the first 50 terms of the series 3, 8, 13, . . . equals

1. 4,750
2. 5,325
3. 5,575
4. 6,275

1-8. Find the sum of the sequence having $d = 4$, $\ell = 37$, and $n = 7$.

1. 275
2. 250
3. 200
4. 175

1-9. Find the fourth term of an arithmetic sequence using the following information: $n = 9$ $\ell = 30$ $S_n = 81$

1. $4\frac{1}{4}$
2. $3\frac{3}{4}$
3. $2\frac{1}{2}$
4. $1\frac{3}{4}$

1-10. What is the common ratio (r) of the sequence $1, \frac{1}{5}, \frac{1}{25}, \frac{1}{125}, \ldots$?

1. $-\frac{4}{5}$
2. $\frac{1}{25}$
3. $\frac{1}{5}$
4. $\frac{4}{5}$

1-11. Find the last term of the sequence where $a = 2$, $n = 7$, and $r = 4$.

1. 64
2. 1,950
3. 6,254
4. 8,192

1-12. What is the first term of a geometric sequence whose sixth term is 24 and seventh term is 8?

1. 3,484
2. 5,832
3. 6,446
4. 8,292

1-13. Find the one geometric mean between $\frac{1}{3}$ and $\frac{4}{27}$.

1. $\pm\frac{1}{6}$
2. $\pm\frac{2}{9}$
3. $\pm\frac{2}{11}$
4. $\pm\frac{2}{15}$

1-14. What is the sum of the first five terms in a geometric series whose first term is 1 and whose common ratio is 4?

1. 341
2. 322
3. 302
4. 285

1-15. What is the sum of a geometric series if $a = 2$, $r = \frac{1}{3}$, and $\ell = \frac{2}{243}$?

1. $\frac{852}{243}$
2. $\frac{728}{243}$
3. $\frac{649}{243}$
4. $\frac{528}{243}$

Learning Objective:

Derive formulas used to solve for various unknown elements in an infinite series, and determine some specified infinite-series terms.

1-16. The term given to a series that continues indefinitely is
1. a finite series
2. an infinite series
3. a geometric series
4. an arithmetic series

1-17. The sum of the infinite series $6 + \frac{9}{2} + \frac{27}{8} + \cdots$ is

1. 16
2. 18
3. 20
4. 24

1-18. What is the third term of the series whose n^{th} term is $\frac{6n - 4}{2n + 1}$?

1. 4
2. 3
3. 2
4. 1

1-19. What formula would represent the n^{th} term for the series $\frac{1}{4} + \frac{1}{8} + \frac{1}{12} + \cdots$?

1. $\frac{1}{5n}$
2. $\frac{1}{4n}$
3. $\frac{1}{3n}$
4. $\frac{1}{2n}$

1-20. What is the n^{th} term for the series

$2 + \frac{3}{4} + \frac{4}{9} + \frac{5}{16} + \cdots$?

1. $\frac{3n + 1}{2n}$
2. $\frac{2n + 2}{n^2}$
3. $\frac{n + 1}{n^2}$
4. $\frac{2n}{n}$

Learning Objective:

Apply various tests to determine if given infinite series' are convergent or divergent, and why, and recognize the characteristics of a harmonic series.

● Items 1-21 through 1-38 relate to convergence and divergence. $U_n = n^{th}$ term.

1-21. The series $\frac{1}{10} + \frac{1}{20} + \frac{1}{40} + \cdots$ is

1. convergent because $\lim_{n \to \infty} S_n = \frac{1}{5}$
2. divergent because $\lim_{n \to \infty} U_n \neq 0$
3. divergent because $\lim_{n \to \infty} U_n$ does not exist
4. convergent or divergent because $\lim_{n \to \infty} S_n = \infty$

1-22. The series $2 + 8 + 32 + \cdots$ is

1. divergent because $\lim_{n \to \infty} S_n \neq 0$
2. divergent because $\lim_{n \to \infty} S_n = \infty$
3. convergent because $\lim_{n \to \infty} S_n = \infty$
4. convergent because $\lim_{n \to \infty} U_n$ does not exist

1-23. The series $-1 + 3 + 7 + \cdots$ is convergent.

1-24. If U_n is the n^{th} term of a series, $\lim_{n \to \infty} U_n = 0$ represents a
1. proof of convergence
2. proof of divergence
3. necessary condition for convergence
4. necessary condition for divergence

1-25. What can be said about the convergence or divergence of a series for which $U_n = 1 - \frac{1}{n + 1}$?

1. Convergent because $\lim_{n \to \infty} U_n = 0$
2. Convergent because $\lim_{n \to \infty} U_n = 1$
3. Divergent because $\lim_{n \to \infty} U_n \neq 0$
4. Convergent or divergent because $\lim_{n \to \infty} U_n \neq 0$

1-26. The series
$\frac{3}{4} + \frac{4}{5} + \frac{5}{6} + \cdots + \frac{n+2}{n+3} + \cdots$ is

1. divergent because $\lim_{n \to \infty} U_n \neq 0$
2. divergent because $\lim_{n \to \infty} U_n = \infty$
3. convergent because $\lim_{n \to \infty} U_n = 1$
4. divergent or convergent because $\lim_{n \to \infty} U_n = 0$

● Before taking the limit, divide the numerator and denominator by the highest power of n. A preliminary test for divergence which may save considerable time is to examine the n^{th} term of a series as n approaches infinity by the method given in your text.

1-27. This preliminary test for divergence shows that the series whose n^{th} term is $\frac{2n}{n^2+1}$ is

1. convergent because $\lim_{n \to \infty} \frac{2n}{n^2+1} = 0$
2. divergent because $\lim_{n \to \infty} \frac{2n}{n^2+1} = 1$
3. divergent because $\lim_{n \to \infty} \frac{2n}{n^2+1} = \infty$
4. convergent or divergent because $\lim_{n \to \infty} \frac{2n}{n^2+1} = 0$

1-28. What two conditions must be met for a geometric series to be convergent?

1. $\lim_{n \to \infty} U_n = 0$ and $|r| < 1$
2. $\lim_{n \to \infty} U_n = 0$ and $|r| > 1$
3. $\lim_{n \to \infty} U_n \neq 0$ and $|r| < 1$
4. $\lim_{n \to \infty} U_n \neq 0$ and $|r| > 1$

1-29. Which of the following is not a characteristic of a harmonic series?

1. $\lim_{n \to \infty} U_n = 0$
2. $\lim_{n \to \infty} S_n = \infty$
3. It is always convergent.
4. The reciprocals of the terms form an arithmetic series.

1-30. The series $a_1 + a_2 + \cdots + a_n$ is known to be convergent, and x_n of the series, $x_1 + x_2 + \cdots + x_n$ is compared to a_n for all corresponding terms. The x series is known to be

1. convergent if $x_n \geq a_n$
2. convergent if $x_n \leq a_n$
3. divergent if $x_n \geq a_n$
4. divergent if $x_n \leq a_n$

● Equations (1) through (4) on page 17 of the text show the "reference" or "t" series. For each of the following unknown or "U" series in items 1-31 through 1-33, select an appropriate "t" series. By the comparison test, determine if the "U" series is convergent or divergent.

1-31. The series $\frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \cdots$ is

1. divergent because $U_n \geq \frac{1}{n}$ of t-series
2. convergent because $U_n \leq \frac{1}{2^n}$ of t-series
3. convergent because $U_n \geq ar^n$ of t-series
4. convergent because $U_n \leq \frac{1}{n}$ of t-series

1-32. The series $\frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \cdots$ is

1. convergent because $U_n \leq \frac{1}{n^p}$ of t-series
2. convergent because $U_n \leq \frac{1}{2^n}$ of t-series
3. convergent because $U_n < \left(\frac{1}{3}\right)^{n-1}$ of t-series
4. divergent because $U_n \geq \frac{1}{n}$ of t-series

1-33. The series $2 + 1 + \frac{2}{3} + \frac{1}{2} + \cdots + \frac{2}{n}$ is

1. divergent because $U_n < \frac{1}{n}$ of the t-series
2. divergent because $U_n > \frac{1}{n}$ of the t-series
3. convergent because $U_n < \frac{1}{2^n}$ of the t-series
4. convergent because $U_n > \frac{1}{2^n}$ of the t-series

1-34. Which statement is true concerning the convergence of the infinite series $U_1 + U_2 + U_3 + \cdots$ if $\lim_{n \to \infty} \left| \frac{U_{n+1}}{U_n} \right| = 0$,

where U_1, U_2, U_3 ... are positive?

1. It is convergent.
2. It is convergent only for n=3.
3. It is not convergent.
4. It may or may not be convergent.

● Use the ratio test to investigate the convergence of the indicated series in items 1-35 through 1-38.

1-35. $\frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \cdots$

1. $\lim_{n \to \infty} \frac{2^n}{2^{n+1}} = 2$; diverges
2. $\lim_{n \to \infty} \frac{2^n}{2^{n+1}} = \infty$; diverges
3. $\lim_{n \to \infty} \frac{2^n}{2^{n+1}} = \frac{1}{2}$; converges
4. $\lim_{n \to \infty} \frac{2^n}{2^{n+1}} = 1$; test fails

1-36. $\frac{3}{1 \cdot 2} + \frac{3^2}{2 \cdot 3} + \frac{3^3}{3 \cdot 4} + \cdots + \frac{3^n}{n(n+1)} + \cdots$

1. $\lim_{n \to \infty} \frac{n+2}{3n} = \frac{1}{3}$; converges
2. $\lim_{n \to \infty} \frac{3n}{n(n+1)} = 0$; converges
3. $\lim_{n \to \infty} \frac{3n}{n+2} = 3$; diverges
4. $\lim_{n \to \infty} \frac{n+2}{3n} = 1$; test fails

1-37. $\frac{3}{1} + \frac{3^2}{3} + \frac{3^3}{5} + \cdots + \frac{3^n}{2n-1} + \cdots$

1. $\lim_{n \to \infty} \frac{3^n}{2n+1} = \frac{3}{2}$; diverges
2. $\lim_{n \to \infty} \frac{6n-3}{2n+1} = 3$; diverges
3. $\lim_{n \to \infty} \frac{6n-3}{2n+1} = \infty$; diverges
4. $\lim_{n \to \infty} \frac{3n}{2n-1} = 0$; converges

1-38. $\frac{1}{2} + \frac{2!}{2^2} + \frac{3!}{2^3} + \cdots + \frac{n!}{2^n} + \cdots$

1. $\lim_{n \to \infty} \frac{n+1}{2} = \infty$; diverges
2. $\lim_{n \to \infty} \frac{2^{(n+1)}}{n!} = 2$; diverges
3. $\lim_{n \to \infty} \frac{2}{n+1} = 0$; converges
4. $\lim_{n \to \infty} \frac{n!}{2^n} = \frac{1}{2}$; converges

Learning Objective:

Recognize the theory of proof by mathematical induction and use this method of proof to verify a mathematical formula.

● In answering items 1-39 through 1-42, refer to the formula $\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{n}{2} = \frac{n(n+1)}{4}$.

1-39. To prove the formula true by mathematical induction as explained in the text, it must first be proven correct for n =
1. 0
2. 1/2
3. 1
4. K-1

1-40. Since the formula works for the case in item 1-39; assume the formula is correct for n = K, where K is any whole number. Therefore, equation (1)
$$\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{K}{2} = \frac{K(K+1)}{4}$$
is assumed to be true and we proceed to prove the formula correct for n =
1. 0
2. 2
3. K-1
4. K+1

1-41. For the value of n found in the preceding item, the formula can be written

1. $\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{7}{2} = \frac{K(K+1)}{4}$
2. $\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{K+1}{2} = \frac{K(K+1)}{4}$
3. $\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{7}{2} = \frac{K^2+3K+2}{4}$
4. $\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{K+1}{2} = \frac{K^2+3K+2}{4}$

1-42. Let the equation, obtained as the answer in the previous item, be equation (2). To prove the original formula for n = K+1, the assumed relation (1),

$$\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{K}{2} = \frac{K(K+1)}{4}$$

must be manipulated so that it becomes identical to equation (2). Since the left sides of (1) and (2) differ by $\frac{K+1}{2}$ we add $\frac{K+1}{2}$ to each side of (1), that is, $\frac{1}{2} + 1 + \frac{3}{2} + \cdots + \frac{K}{2} + \frac{K+1}{2}$

$= \frac{K(K+1)}{4} + \frac{K+1}{2}$ $\left(\text{equation (3)}\right)$.

Which of the following conclusions may be drawn concerning equations (2) and (3)

1. (2) and (3) say the same thing and the original formula is untrue.
2. (2) and (3) say the same thing and the original formula is true.
3. (2) and (3) say different things and the original formula is untrue.
4. (2) and (3) say different things and the original formula is true.

Learning Objective:

Recognize the characteristics of an expanded binomial and solve or evaluate problems based upon the expansion of a binomial.

1-43. How many terms are in the expansion of $(x + y)^7$?

1. 9
2. 8
3. 7
4. 6

1-44. The sum of the exponents of each term in the expansion of $(x + y)^8$ is

1. 9
2. 8
3. 7
4. 6

1-45. The coefficient of the fourth term of the expansion of $(x + y)^7$ is

1. 15
2. 20
3. 25
4. 35

1-46. The third term of the expansion of $[(3x) + (-2y)]^3$ is

1. $36xy^2$
2. $18xy^2$
3. $12xy^2$
4. $3xy^2$

1-47. Evaluate $(1 + 0.02)^6$ to the nearest hundredth.

1. 1.13
2. 1.14
3. 1.15
4. 1.16

1-48. Evaluate $(1 + 0.04)^4$ to the nearest hundredth.

1. 1.15
2. 1.16
3. 1.17
4. 1.18

1-49. Evaluate $(0.96)^4$ to the nearest hundredth by calculating the value of the appropriate binomial expansion.

1. 0.70
2. 0.80
3. 0.85
4. 0.99

1-50. What is the third term of $(m^3 - 2)^5$?

1. $10m^6$
2. $20m^6$
3. $30m^3$
4. $40m^9$

1-51. What is the sixth term of $(x + y)^{10}$?

1. $252x^5y^5$
2. $252x^5y^6$
3. $252x^6y^5$
4. $252x^6y^6$

1-52. The third term of $(3x + 3y)^5$ is

1. $90x^3y^2$
2. $180x^3y^2$
3. $270x^3y^2$
4. $2430x^3y^2$

1-53. What is the sixth term of $(2m^3 - x^2)^8$?

1. $56m^6x^{10}$
2. $112m^9x^{10}$
3. $-224m^6x^{10}$
4. $-448m^9x^{10}$

1-54. What is the fourth term of the expansion of $(x + y)^{-3}$? (y is less than x.)

1. $-10x^{-6}y^3$
2. $-15x^{-6}y^3$
3. $20x^{-6}y^3$
4. $30x^{-6}y^3$

1-55. The fifth term of $(x + y)^{1/2}$ after expansion and simplification is

1. $-\frac{y^4}{64x^{7/2}}$

2. $-\frac{5y^4}{128x^{7/2}}$

3. $\frac{y^4}{32x^{7/2}}$

4. $\frac{5y^4}{32x^{7/2}}$

1-56. Evaluate $\sqrt[4]{12}$ to the nearest hundredth.

1. 1.86
2. 1.87
3. 1.88
4. 1.89

1-57. What number would be between 28 and 56 in the next row of a Pascal's triangle?

1. 69
2. 78
3. 81
4. 84

1-58. Using Pascal's triangle shown on page 28 of the text determine the coefficient of the fourth term of $(x + y)^n$ when $n = 8$.

1. 62
2. 56
3. 48
4. 42